

ESCHMEYER NEXUS, A NEW GENUS AND SPECIES OF SCORPAENID FISH FROM FIJI

Stuart G. Poss and Victor G. Springer

Abstract.—*Eschmeyer nexus* is described from a single mature female 41.3 mm in SL, taken in 27–43 m from Ono-i-lau in the Lau Islands, Fiji. It can be distinguished from other scorpaenids by the following combination of characters: 8 short dorsal-fin spines, 3 spines and 8 segmented rays in the anal fin; 19 or 20 pectoral-fin rays; 1 spine and 3 segmented rays in the pelvic fin; only unbranched rays in fins; no scales (except in lateral line); branchiostegal membranes not fused to isthmus; no preorbital spines; and no slit behind posteriormost hemibranch.

A distinctive new genus and species of scorpaenid fish was collected from Ono-i-lau, Lau Islands, Fiji. The new form emphasizes the problems inherent in the most comprehensive and widely used classification of the scorpaenoids (Matsubara 1943a, b). It exhibits a number of advanced and primitive character-states not previously observed in combination in scorpaenoids, further obscuring the limits of several traditionally recognized but inadequately defined family-group taxa. The purpose of this paper is to make a name available for this species, deferring discussion of its relationships until the morphology of other presumably related scorpaenids can be more thoroughly studied. Assignment of this new species to the Scorpaenidae anticipates conclusions reached in studies now in progress by the first author.

Methods of taking counts and measurements follow those of Eschmeyer (1969) as modified by Poss and Eschmeyer (1978).

The right side of the holotype was dissected to reveal the configuration of the swimbladder musculature and to expose the dorsal bony elements of the first gill arch which were stained with alizarin but not removed.

Eschmeyer, new genus

Type-species.—*Eschmeyer nexus*.

Diagnosis.—A scorpaenid fish with: dorsal fin VIII, 13; anal fin III, 8; pelvic fin I, 3; 19 or 20 pectoral-fin rays; extremely short anterior dorsal-fin spines; only unbranched rays in fins; frontal and parietal bones strongly ossified; no preorbital spines; no scales (except for lateral line); branchiostegal membranes not fused to isthmus; and no slit behind posteriormost hemibranch.

Description.—Head large, slightly compressed (Figs. 1 and 2), with posterior half of frontal and parietal bones strongly ossified, rugose. Lacrimal (infraorbital 1) immovable, with posteroventral border tapering to a small point. Nasal bone tubular, without spine. Mouth upturned. Teeth on vomer; none on palatines. No slit behind posteriormost hemibranch. Three infrapharyngobranchial tooth plates. Epibranchial of first gill arch with elongate uncinat process diverging from ramus of bone at angle of about 45° (Fig. 3; presence of interarcual cartilage uncertain). No cirri on lower jaw. Branchiostegal rays 7. Branchiostegal membranes of each side not fused to isthmus. Isthmus with fleshy extension posteriorly. Ventral

surface of urohyal with broad transverse flange. Body compressed, oblong; skin slightly granular, scaleless, except for lateral line. Swimbladder absent. Swimbladder musculature present, originating from cranium and cleithrum and inserting on parapophyses of vertebrae 6–10 (Fig. 4). Baudelot's ligament attached to first vertebra. Neural spines of vertebrae 6–9 thin, almost hair-like (Fig. 5). Proximal dorsal-fin pterygiophores (except anteriormost 2) interdigitating without interruption between successive neural arches of precaudal vertebrae. Caudal skeleton with parhypural and hypurals 1 and 2 fused into single autogenous plate, hypurals 3 and 4 fused and forming autogenous plate (slightly fused to urostyle?); hypural 5 autogenous; haemal spines of second and third preural centra autogenous; neural spine of second preural centrum short, 3 epurals; 2(1?) pairs of uro-neurals; hypurapophysis absent.

Etymology.—Named for Dr. William N. Eschmeyer in recognition of his contributions to the study of scorpaenoid fishes; gender is masculine.

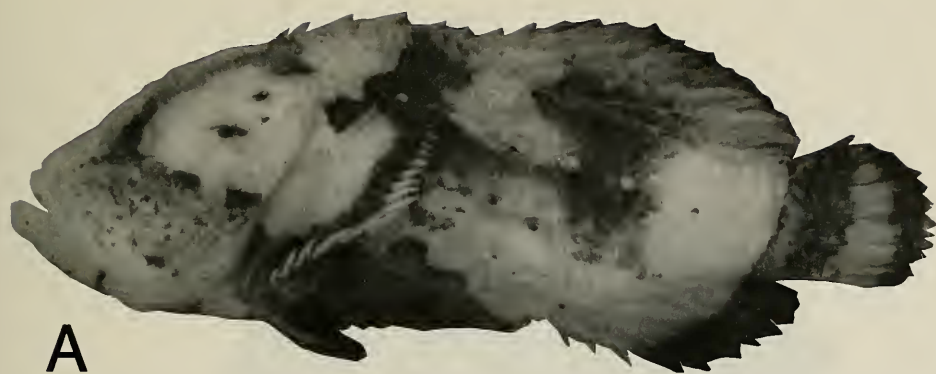
Eschmeyer nexus, new species

Figs. 1–5

Holotype.—USNM 233855, 41.3 mm in standard length (SL). Fiji Is., Ono-i-lau I., outside of barrier reef on NW side of island 21°38'S, 178°45'W, 27–43 m, V. G. Springer party, Sta. VGS-82-14, 1 May 1982, 0705–1000 hrs. Mature female.

Description.—Dorsal VIII, 13 (posteriormost ray split to base, counted as one); anal III, 8 (posteriormost split); pectoral 19 (left), 20 (right); pelvic I, 3; vertebrae 10 + 15 = 25.

Anterior profile of head inclined about 39° from horizontal. Skin over lower part of head somewhat loose, wrinkled, and slightly granular in texture. Four infraorbital bones; second deep, with large subocular shelf on dorsomedial border (widest posteriorly). Third infraorbital bone deep, without spine, with shelf on dorsomedial border continuous with that on second infraorbital bone. Interorbit broad. Interorbital ridges weak, widely spaced, converging slightly but not meeting over midorbit. Supraorbital ridge vaguely defined, better ossified posteriorly. Anterior nostril prominent, pore situated before orbit, bordered anteroventrally by smaller pore of infraorbital sensory canal and anterodorsally by pore of supraorbital canal. Laterosensory pores of head distinct, moderately sized, with slightly raised margins. Preopercle with 5 short, blunt spines, uppermost (first) most pungent, second largest, fifth a weak point. Pores of preopercular sensory canal with notably raised margins. Opercle strongly ossified, with 2 large, blunt spines on posterodorsal margin, smaller ventral spine more pungent; dorsal margin inclined dorsoposteriorly about 5° above horizontal axis of body. Interopercle without spine. Parietal with broad low ridge. Pterotic with low ridge. Posttemporal emarginate anteriorly, not forked; with strong spine. Supracleithrum bearing small, strong spine. Cleithral spine present. Ventral margin of dentary not strongly directed medially; no symphyseal knob. Mandibular pores 5 on each side, anteriormost 2 pores near symphysis arranged one behind the other. Anguloarticular bone not projecting strongly posteroventrally, inclined ventromedially at angle of about 45°. Maxilla without cirrus, extending to below middle of pupil. Gill rakers short, 14 total, 4 on upper arch, 10 on lower arch. Pseudobranch with 11 filaments.



A



B



C

Fig. 1. Holotype of *Eschmeyer nexus*, USNM 233855, 41.3 mm SL. A, Lateral view; B, Dorsal view; C, Ventral view.

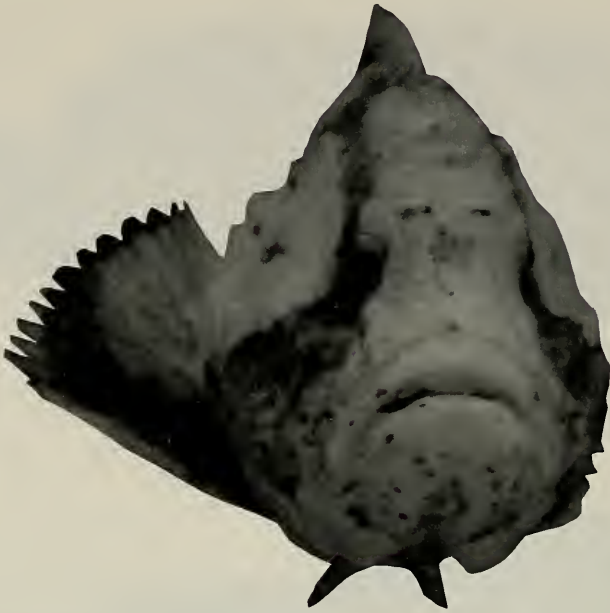


Fig. 2. Holotype of *Eschmeyer nexus*, USNM 233855.

Lateral line not high on body, with 10 tubed scales, posteriormost on base of caudal fin. Lateral line scales without spinous projections.

Dorsal fin originating over middle of operculum, spine in anterior part of fin extremely short, stout, and pungent. Dorsal-fin membrane weakly incised between spines 3 and 4. Longest pectoral-fin rays (9–11 from dorsalmost) not reaching anus. Pelvic-fin insertion at base of pectoral fin. Pelvic-fin membrane adnate to body, fused to membrane of opposite side (see *Comparisons* below). Caudal fin stubby, rounded, with 18 total fin-ray elements (2 procurrent and 8 segmented dorsally, 7 segmented and 2 procurrent ventrally).

Color in life unknown. Color pattern in 70% ethanol as in Fig. 1. Body color pale yellowish brown, covered by several broad dark-brown to brownish-black bars or patches. Two large saddle-shaped, somewhat irregular bars on upper two-thirds of body and dorsal-fin base; bars diffusely connected by narrower band just below lateral line; anterior bar below dorsal spines 5–8, posterior bar below segmented dorsal rays 2–9. Broad, dark greyish-brown patch on belly and lower part of pectoral-fin base, continuous with broad, nearly black, mostly submarginal band on lateral and medial surfaces of pectoral fins. Pale transverse band extending across breast, just anterior to pectoral fins. Broad, uninterrupted brownish-black oblique band extending across caudal-fin base and distal part of segmented anal-fin rays. Narrower, but similarly colored, subterminal bar on caudal fin. Head with two brown bars radiating from eye; lower bar much broader, extending posteroventrally across cheek, over preopercle and lower half of opercle; upper bar narrower, directed dorsomedially and fused to slightly broader, small saddle-shaped bar extending transversely over dorsal-fin origin. Few irregular dark-brown spots over anteroventral part of body and dorsal part of opercle. Few dark scattered specks in interorbit and over lower jaw.

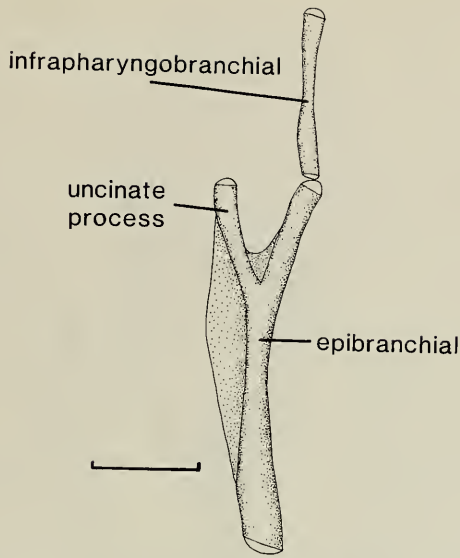


Fig. 3. Dorsolateral view of upper elements of right first gill arch in *Eschmeyer nexis*. Bar represents 1 mm.

Measurements for holotype (percent SL in parentheses): Head length 16.7(40); snout length 4.1(10); orbit diameter 3.9(9); interorbital width 3.2(8); upper jaw length 8.5(21); length of postorbital part of head 8.7(21); greatest body depth 15.2(37); anal-fin length (base of first spine to end of longest ray) 13.9(34); caudal-fin length 9.0(22); pectoral-fin length 8.7(21); pelvic-fin length 7.3(18). Dorsal-

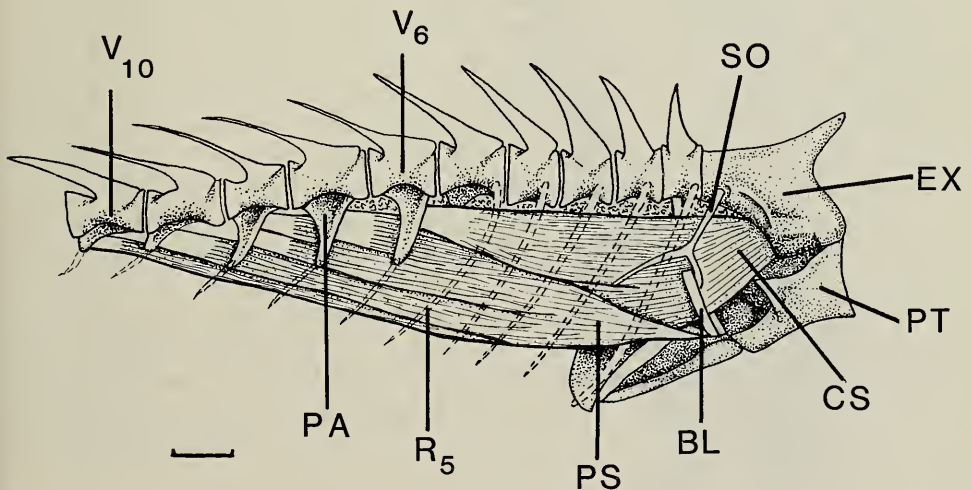


Fig. 4. Dorsal (slightly oblique) view of *Eschmeyer nexis* swimbladder muscle and associated bony elements. Ribs, indicated by dashed line, lie dorsal to swimbladder muscle. BL, Baudelot's ligament. CS, cranial slip of swimbladder muscle. EX, exoccipital. PA, vertebral parapophysis. PS, pectoral girdle slip of swimbladder muscle. PT, posttemporal. R₅, rib associated with 5th vertebral centrum. SO, spinooccipital nerve. V_{6,10}, 6th, 10th vertebral centrum. Bar represents 1 mm.

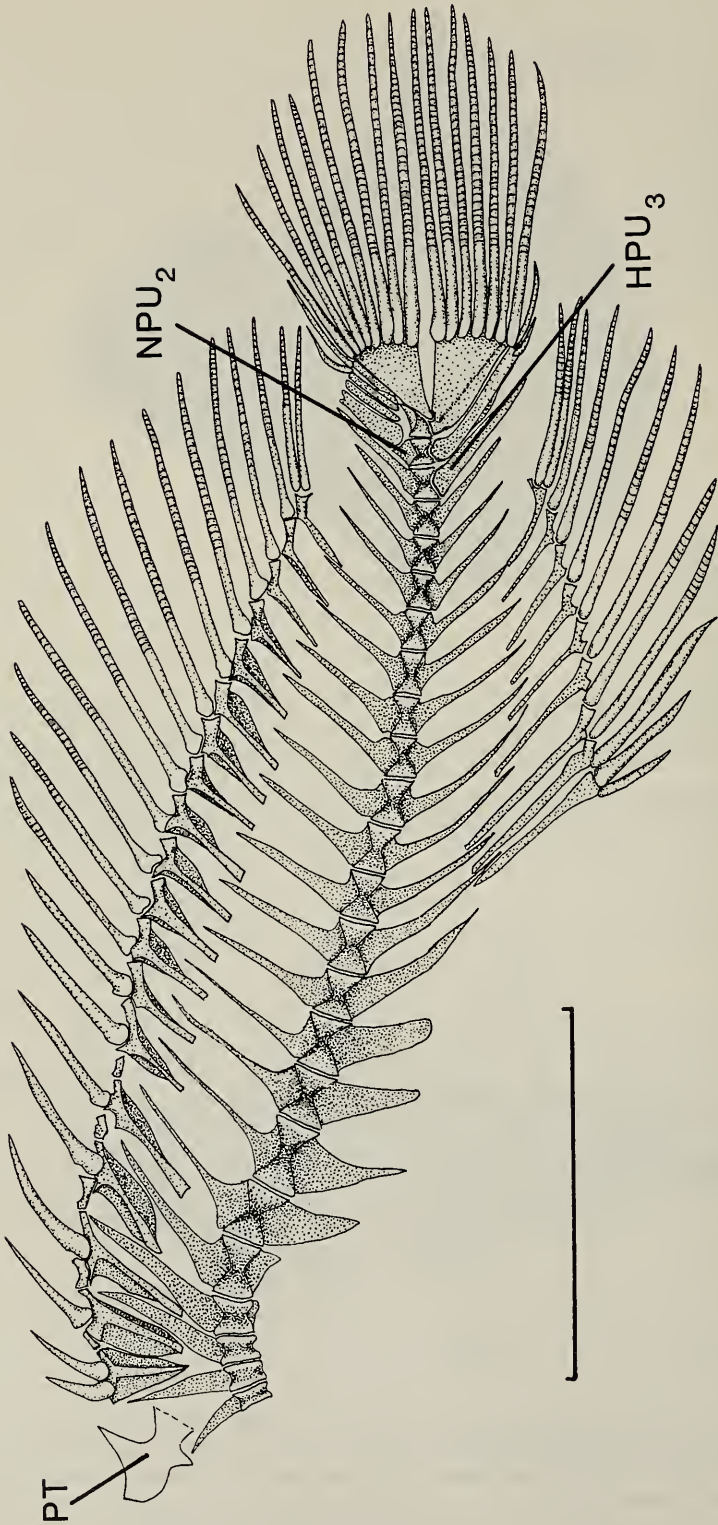


Fig. 5. Postcranial axial skeleton and posttemporal of *Eschmeyer nexus* (based on radiograph, for relation of ribs see Fig. 4). HPU₃, haemal spine of third preural centrum. NPU₂, neural spine of second preural centrum. PT, posttemporal. Bar represents 1 cm.

spine lengths: first 1.5(4); second 1.9(5); third 3.2(8); fourth 3.9(9); fifth 3.5(8); penultimate 3.6(9); last 4.4(11). Anal-spine lengths: first 2.3(6); second 3.2(8); third 4.7(11). Distance between interorbital ridges 2.2(5); least depth of caudal peduncle 6.0(14). Distance from snout tip to: [base of] first dorsal spine (predorsal length) 15.1(37); second dorsal spine 16.2(39); third dorsal spine 17.5(42); fourth dorsal spine 19.9(48); fifth dorsal spine 21.8(53); pelvic-fin insertion 14.2(34). Transverse width of first dorsal spine at midlength 0.2(0.5); deepest incision of fin membrane between third and fourth dorsal spines (from tip of fourth spine to membrane) 1.0(2); length of dorsalmost preopercular spine 1.4(3). Distance between: tip of opercle and dorsal-fin base 5.2(13); first and fifth dorsal spines 6.1(15); fifth and last dorsal spines 4.8(12); last dorsal spine and last dorsal ray 6.2(15); anal-fin origin and last anal ray 10.7(26); pelvic-fin insertion and anal-fin origin 16.8(41); first dorsal spine and pelvic-fin insertion 14.0(34); first dorsal spine and anal-fin origin 21.2(51); fifth dorsal spine and pelvic-fin insertion 15.9(38); last dorsal spine and pelvic-fin insertion 17.5(42); last dorsal spine and last anal ray 19.2(46); last dorsal ray and anal-fin origin 13.7(33); last dorsal spine and anal-fin origin 13.8(33).

Etymology.—From the Latin *nectere* (to tie or connect) in reference to features of the species that, in combination, suggest a close relationship to several groups of scorpaenoids. Here treated as a noun in apposition.

Remarks.—The holotype was captured by use of SCUBA and rotenone in an area usually having strong wave action. Especially calm weather made diving at this locality possible. Rotenone was placed in a large gently downsloping channel in the reef slope at a depth of about 27 m and on the steep sloping face of the reef at about 36 m. Dead fishes of a number of species were picked up to a depth of about 43 m, but most were obtained from the channel at the shallowest depth.

Comparisons.—*Eschmeyer* can be differentiated from all other scorpaenid fishes by the combination of characters given in the diagnosis. Among scorpaenids only *Minous* Cuvier (Scorpaenidae: Minoinae) has as few as 8 dorsal spines (7–12). *Eschmeyer* differs conspicuously from *Minous* in having 3 rather than 5 segmented rays in the pelvic fin and in lacking a detached ray in the pectoral fin, branchiostegal membranes that are fused to the isthmus, preorbital spines, and a movable lacrimal. Among scorpaenoids, *Eschmeyer* is perhaps most similar to *Peristrominous* Whitley (Aploactinidae) in overall appearance but can be distinguished readily in having 8 dorsal-fin spines (12 or 13 in *Peristrominous*), 19 or 20 pectoral-fin rays (14 or 15 in *Peristrominous*), 3 anal-fin spines (1 in *Peristrominous*), and in lacking a fleshy extension at the anteriormost part of the isthmus.

Among other scorpaenids, fusion of the pelvic-fin membranes to each other is an atypical condition known to occur only rarely in some specimens of *Gymnapistes marmoratus* (Cuvier) and *Vespacula dracaena* (Cuvier), both currently assigned to the Tetraroginae. Whether the holotype of *Eschmeyer nexus* is such a variant is unknown.

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(SGP) Department of Ichthyology, The Academy of Natural Sciences of Philadelphia, Nineteenth and the Parkway, Philadelphia, Pennsylvania 19103. (VGS) Division of Fishes, National Museum of Natural History, Washington, D.C. 20560.